PB80-187552

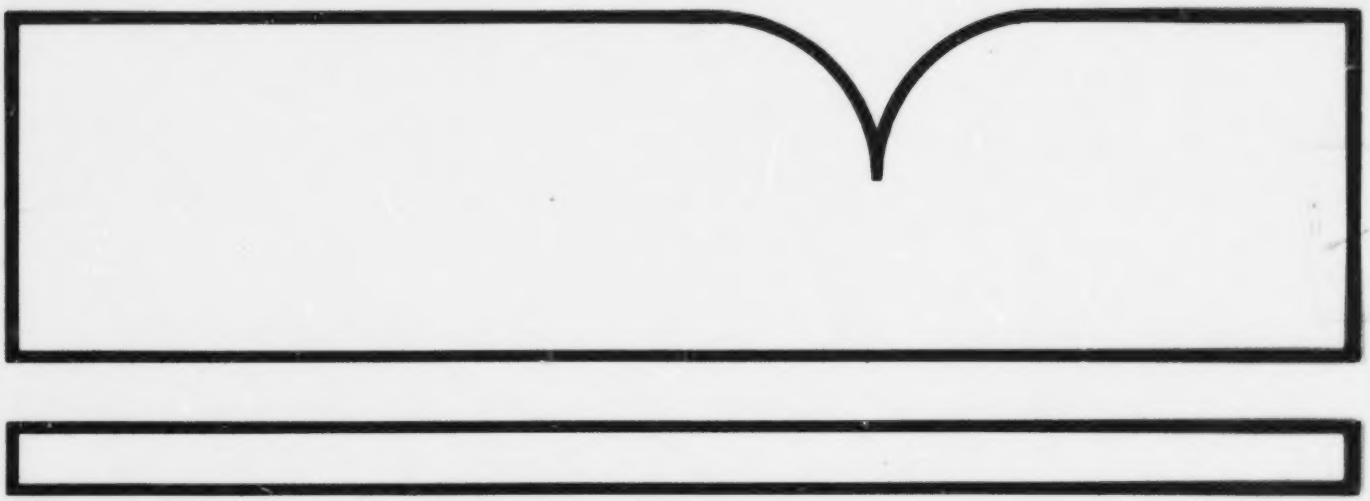
Urban Air: A Guide to the Clean Air Act for Local Elected Officials

United States Conference of Mayors
Washington, DC

Prepared for

Environmental Protection Agency
Washington, DC

Feb 80



U.S. Department of Commerce
National Technical Information Service
NTIS

PB80-187552

Urban Air

A Guide to the Clean Air Act for Local Elected Officials

February 1980

UNITED STATES
CONFERENCE OF MAYORS

REPRODUCED BY
NATIONAL TECHNICAL
INFORMATION SERVICE
U.S. DEPARTMENT OF COMMERCE
SPRINGFIELD, VA 22161

This report is part of the U.S. Conference of Mayors Clean Air Program. It was prepared by Audrey Hoffer and Tom McClimon of the Conference staff under Grant T-900882-01. The grant is sponsored by the U.S. Environmental Protection Agency and the Departments of Transportation, Commerce, and Housing and Urban Development. The contents do not necessarily reflect the official views or policy of these agencies.

TECHNICAL REPORT DATA
(Please read Instructions on the reverse before completing)

1. REPORT NO.	2.
3. RECIPIENT'S ACCESSION NO.	PB80 187552
4. TITLE AND SUBTITLE Urban Air --A Guide to the Clean Air Act for Local Elected Officials	5. REPORT DATE February, 1980 6. PERFORMING ORGANIZATION CODE
7. AUTHOR(S) Audrey Hoffer and Tom McClimon	8. PERFORMING ORGANIZATION REPORT NO.
9. PERFORMING ORGANIZATION NAME AND ADDRESS United States Conference of Mayors 1620 'I'St. N.W. Washington, D.C. 20006	10. PROGRAM ELEMENT NO. 11. CONTRACT/GRANT NO. T-900882-01
12. SPONSORING AGENCY NAME AND ADDRESS U.S. Environmental Protection Agency, et al. Office of Transportation and Land Use Policy 401 'M' St., S.W. Washington, D.C. 20460	13. TYPE OF REPORT AND PERIOD COVERED 14. SPONSORING AGENCY CODE

15. SUPPLEMENTARY NOTES
other sponsoring agencies: Departments of Transportation, Commerce, and Housing and Urban Development

16. ABSTRACT
This report explores experiences of cities attempting to resolve conflicts between the requirements of the Clean Air Act Amendments of 1977 (CAA) and those of city programs such as economic growth, transportation and community development. It also seeks to help local officials better understand about the air quality planning process and its relati onship to transportation, community development and economic development.

17. KEY WORDS AND DOCUMENT ANALYSIS

a. DESCRIPTORS	b. IDENTIFIERS/OPEN ENDED TERMS	c. COSATI Field/Group

18. DISTRIBUTION STATEMENT	19. SECURITY CLASS *(This Report)*	21. NO. OF PAGES
Release Unlimited	20. SECURITY CLASS *(This page)*	22. PRICE

EPA Form 2220-1 (Rev. 4-77) PREVIOUS EDITION IS OBSOLETE

Preface

This Guide is for mayors and other local elected officials who want to better acquaint themselves with alternative strategies for achieving clean air and urban growth. It explores the experiences cities have had as they attempt to balance environmental and developmental objectives. It is hoped that this will be a useful document for cities as they continue to work towards more effective policies in the future.

ACKNOWLEDGEMENTS

The Clean Air Program would like to acknowledge the continuing support, assistance and advice given by the following people during the course of the project. Without their help, this project would not have been a success.

Richard Carver, President, U.S. Conference of Mayors, Mayor of Peoria, Illinois

John Gunther, Executive Director, U.S. Conference of Mayors

Melvin Mister, Director, Office of Program Development, U.S. Conference of Mayors

Hugh Mields, Project Advisor, U.S. Conference of Mayors

Felicity Gillette, Chief, Program Development Division Economic Development Administration

Leroy Johnson, Program Coordinator, Office of Intergovernmental Affairs, Department of Transportation

Jerry Kurtzweg, Chief, Transportation and Land Use Policy Branch, Environmental Protection Agency

Charles Szczepanski, Air Quality Program Officer, Office of Environmental Quality, Department of Housing and Urban Development

Urban Land Institute

Kay Nelson as our office colleague

Support services of the U.S. Conference of Mayors

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I. INTRODUCTION

A. Purpose of Guide

The Clean Air Act Amendments of 1977 (CAA) pose a difficult problem for many cities in the United States -- how to reconcile the goals of air pollution control and urban development. As local government officials attempt to implement pollution control measures they often find that the requirements result in conflicts with other city programs such as economic growth, transportation and community development.

Cities have had a wide range of experiences as they have attempted to resolve these conflicts and balance both environmental and economic objectives. This "Guide to the Clean Air Act for Local Elected Officials" explores some of these experiences. It also seeks to help local officials better understand about the air quality planning process and its relationship to transportation, community development and economic development.

There are a number of options a city can choose as it seeks to reduce air pollution from its commercial and residential facilities, factories, and motor vehicles. Some options rely on modifications in a city's transport system; some on central city zoning changes; and some on city and federal sponsored assistance programs for businesses. Some of the options are politically unpopular and/or controversial. Some will be costly for the private sector while

others may burden the city's budget. Nevertheless, all are designed to assure a more healthy and livable urban environment for our citizens.

Local government officials must be able to evaluate these alternatives and determine which best meet their community's needs. This Guide is designed to assist Mayors, other local elected officials and their staff in that effort. The Guide is organized into sections dealing with major categories of federal agency programs - economic development, community development, transportation, and air quality. Each section discusses the various options available to a city. Also in the Guide is a brief review of the CAA and the current Congressional views regarding the future of the Act. The final section consists of general recommendations for city action.

B. Review of Clean Air Program

The options described in this Guide were discussed during the Clean Air Conferences organized by the U.S. Conference of Mayors (USCM) as part of its' Clean Air Program. The program was designed to involve mayors and other elected officials in the air quality planning process and to sensitize them to the role they can and should play.

It was also designed to bring together government decision makers in the areas of community development, economic development, transportation and air quality, with the private sector to talk about the reconciliation of the objectives of the Clean Air Act with urban development.

The program is supported and sponsored by four federal agencies - the Environmental Protection Agency and the Departments of Transportation, Housing and Urban Development and Commerce. The joint sponsorship of four federal agencies underscores the importance of this program. It indicates an awareness on their part of both the necessity to integrate environmental, transportation, economic and community development goals at the highest level of government and to hear first hand the concerns of local representatives in meeting the various federal regulations.

The core of the USCM Clean Air Program has been a series of five regional conferences held over the past few months in Los Angeles, Dayton, New Orleans, Waterbury and Phoenix. Approximately one hundred people, including mayors, city, state and federal officials and the business community gathered for two days in each city to discuss, analyze and offer suggestions on the best way to integrate environmental and economic goals. Each conference was developed around the unique problems of the host city and the region in which it was located. The discussions which resulted from these conferences serve as the basis for the discussions presented in this Guide.

In addition to the five regional meetings, three small informal workshops were held in Baltimore, Pittsburgh and Cincinnati. At these meetings city and Conference of Mayors staff discussed the

strategies the host city was attempting to develop to balance urban development and clean air goals.

The USCM Clean Air Program also publishes a newsletter entitled "Urban Air" which is designed to provide mayors and other interested public and private officials with current information on air quality and its relationship to community development, economic development and transportation.

Through these meetings and newsletters the Conference of Mayors serves as a liaison to cities across the country who are striving to meet the requirements of the Clean Air Act and simultaneously sustain reasonable growth in their communities. This Guide is one means to help them achieve this goal.

C. Congressional Intent and the Clean Air Act

The 1970 Clean Air Act charged the U.S. Environmental Protection Agency (EPA) with the establishment of National Ambient Air Quality Standards (NAAQS) for those air pollutants that are damaging to the public health and welfare. The progress a state makes toward attainment, maintenance and enforcement of these standards is monitored by an EPA approved State Implementation Plan (SIP).

At this time six pollutants have been identified by EPA as requiring NAAQS. They are total suspended particulates; sulfur dioxide; carbon monoxide; ozone; nitrogen dioxide and lead. A hydrocarbon standard was established as a means for attaining the ozone standard.

Pursuant to the Act two categories of standards for these pollutants were created: primary and secondary. Primary standards were set to protect human health. Stricter secondary standards were set to protect human welfare including property and the environment.

The 1970 Act stated that primary standards were to be attained within three years after EPA approved each state SIP and that secondary standards were to be achieved within a "reasonable time". Recognizing the difficulties encountered by the states in meeting these ambient standard time limits, the 1977 Clean Air Act Amendments provided for an extension of the attainment deadline until December 31, 1982. In addition, the Amendments provided that areas unable to meet the 1982 deadline for either of the transportation-related pollutants, ozone and carbon monoxide, would be granted another extension until no later than December 31, 1987.

If a state provides evidence of the need for an extension to 1987, the 1977 Amendments require that a specific schedule be established for implementation of a vehicle inspection and maintenance (I&M) program. The vehicle I&M provision had to be contained in the SIP revision of January 1, 1979.

The states were given considerable flexibility in selecting a mix of emission limitations and control techniques to achieve health standards and to accomodate future industrial growth. The plans nonetheless had to include comprehensive emission inventories

so that the amount of pollution in the air, where it is coming from and what reductions are necessary to meet the new attainment dates, could be readily determined. States also had to demonstrate reasonable further progress toward achieving health standards with guaranteed annual incremental reductions of pollutants.

To assure that adequate plans would be submitted and approved on a timely basis, the Act imposed construction prohibitions and in some cases Federal funding sanctions, including loss of federal highway and sewer funds, if the states or EPA failed to respond expeditiously to the mandates of Congress.

There are many who wish to see the Clean Air Act amended to weaken the standards and reduce the requirements. The message from Congress at this time is that they do not intend to change the law in the near future. In the judgement of Congress the Act is working to protect public health while accomodating growth and the air quality standards should remain at their existing level.

In hearings before the Subcommittee on Health and the Environment in November 1979 an EPA official was optimistic about the future of the federal clean air program based upon agency experience to date. He said that some 700 permits for construction had been approved with only two denials, both of which have since been granted. He added that approximately 600 emission offset transactions have taken place. This report, exemplifies the progress

being made in carrying out the mandate of the Act in both clean and dirty air areas.

The Clean Air Act, however, deserves careful oversight during implementation. Because the burden of implementation ultimately falls on local officials they are encouraged to involve themselves in the process and voice their concerns about what they think works and what does not, what should be continued and what should be reshaped. Cleaning up the nation's air is a dynamic process and while a good start has been made, a lot more work still needs to be done.

II. DISCUSSION OF ISSUES

This section comprises the main body of the Guide. The issues facing each of the four federal sponsoring agencies are discussed with a focus on the alternative strategies a city can employ as it works to achieve growth and clean air.

A. Economic Development

1. Emission Offset Policy

According to a ruling adopted by EPA in 1976, major new or modified sources of a pollutant seeking to locate in a nonattainment area could be granted a construction permit only if certain stringent requirements including a combination of emission controls and emission offsets were met. EPA's approach was reaffirmed in the 1977 Clean Air Act Amendments as the Emission Offset Policy and it is the primary strategy by which cities can accomodate development in areas of poor air quality. The federal policy is applicable in only limited circumstances after July 1979. State procedures replace the federal requirements once SIPs are approved. Most state procedures correspond quite closely to the federal approach. A few states are using an alternative strategy, the "growth cushion" approach. Basically the growth cushion approach provides more stringent controls on existing sources so as to allow for new emissions and NAAQS attainment.

Under an emission offset program, new or expanding firms must reduce existing emissions from another source by more than

enough to "offset" the new emissions. Offsets can be created either by installing additional control measures beyond what is required to attain the standards on an existing source or by terminating the operations of an existing source by agreement or purchase. The offset policy is limited in that offsets between facilities must be compatible in physical proximity and pollutant composition. In addition, they must compensate for emissions at the same time of day and season of the year.

It is helpful to look at previous offset experiences in other areas of the country to get a view of the state of the art. Over six hundred offset transactions have occured to date. Most external offsets, which involve obtaining emission reductions from sources with different owners, have been for large industrial complexes. Examples are the General Motors plants in Oklahoma City and Shreveport; the Volkswagen plant in New Stanton and an oil refinery in Portsmouth. In these cases, local and state economic development officials as well as Chamber of Commerce representatives acted as brokers and arranged for the offsets from other industries or from emission reductions in state activities. The new firms did not pay for the offsets or the brokerage services, in large part because the government economic development officials were so eager to attract new industry. Offsets are still an emerging process arranged on an ad hoc basis but there definitely is a role for local elected officials and local government agencies in making the arrangements.

Cities can use emission offsets to attract new industry. One way that has been suggested is to use public funds to purchase offsets from industries closing down or leaving their jurisdictions. The city could offer the offsets to prospective industries as part of a total development package.

The second means is through the establishment of an emission banking program. Emissions banking is an offset management system whereby emission reductions in excess of those required by regulations may be "banked" by a firm or government agency to use at a later time or to sell to another source seeking emission offsets. By allowing emission reductions to be banked, firms are given the incentive to install cost-effective control technologies, thus reducing the long-range costs of achieving air quality standards and providing a margin for industrial expansion and development. Cost savings are realized when an adequate supply of banked emissions is available to provide offsets needed for development. Without banking, a firm seeking to locate or expand in a nonattainment area may experience delays in permit issuance due to the unavailability or cost of arranging offsets. A ready supply of offsets created through emission banking can greatly reduce the uncertainty and the risks of finding offsets, help to avoid permit and construction delay, and thus enable a firm to save money.

Development of an emissions banking system can take several forms. Emission banking can be advanced through private, public, local, or regional markets. Financing may be obtained privately

or through public bonds. Administration may be the responsibility of the state, the locality, or some other institution. Local governments may take an active role as Louisville, San Francisco and St. Paul have in developing their own reductions to promote development in their city or they may allow the private market to work alone.

A main objective of the Louisville Plan has been to keep the banking system simple to understand and easy to administer. Therefore, the system has used existing agency forms and processes to every possible extent. For example, the process for banking an emission closely follows that of the permitting procedures. The source creating the offsets has the right to the first use of the offsets and has control over sales. Banked emissions are released by permit only. The permit is obtained through the local pollution control agency, who has the responsibility of keeping public records of all deposits and withdrawls.

The Louisville banking system is working because its simplicity is its greatest asset. It attempts to increase the certainty for industry of the value of excess emission reductions and the availability of offsets, without making the process complicated and cumbersome.

The San Francisco area has also initiated a banking program. The system is based on depositor control with a public ledger of deposits and withdrawls. Rules in effect at the time a deposit is banked stay constant for three years, thus ensuring the depositor

continuity and certainty. In an effort to forward further reasonable progress, moratoria on both deposits and withdrawls may be imposed by the regional air pollution control authority.

Another form of emission offset management is emission density zoning as applied in St. Paul. This program establishes legal limits on the amount of pollutant emissions within defined spatial areas. The intent of emission density zoning is to maintain present air quality standards and to avoid "hot spots" - high concentrations of pollutants. The conceptual framework of emission density zoning is similar to that of land-use zoning. Additional information about this system is discussed in the air quality section of this Guide.

Although there is no specific model for an emission banking system to follow, it should be designed to meet certain objectives and the needs of existing industry, new industry, local economic development and planning agencies, and the environmental regulatory agency. It can also:

- o decrease the costs and delays to new and existing firms in attaining controls to reduce pollution;
- o decrease the potential cost of finding and negotiating the purchase of an emission reduction;
- o improve the capability of local governments to offer emission reductions as part of or as an incentive to firms they are promoting;
- o improve the procedural steps for having new source permits reviewed.

Banking rules must also be established and strictly enforced. Procedural rules must be established addressing the certification, trading and application of banked emissions. Guidelines must be established as to what sources will and will not be allowed to bank reductions. Rules must be developed outlining the storage and transfer of banked emissions. Industry must be assured that their deposits will not be confiscated should changes occur in the SIP. Administrative rules must set forth the limits and procedures for trading.

In order to remain competitive, it is becoming increasingly important for localities to explore innovative methods of offset management. While localities have the most to gain from establishing a banking program they also have the most to lose, namely economic development, if they fail to meet the need for an offset management program.

2. Assisting Small Businesses

Small businesses are generally perceived as the backbone of the American economic system. Small businesses have been innovators of new technology and are prolific in the creation of new jobs, especially for entry level and lower skilled workers. Government policies encourage small businesses with loan programs, procurement preferences, etc. When it comes to regulatory actions such as the Clean Air Act, however, small businesses can suffer unduly because they are financially fragile and often have limited product lines which are vulnerable to regulation.

The major impact of the Clean Air Act upon small businesses results from the cost of control equipment that must be installed and from the disruption caused by the reformulation of a product, elimination of product lines or radical changes to manufacturing processes. Small companies often do not have the laboratories or technical specialists to reformulate products and dropping a product line could mean bankruptcy. As a result, some small manufacturers are forced to sell out or merge in order to survive the disruption to their business. As the co-founder of a small Los Angeles paint manufacturing company stated, "We simply do not have the finances, the personnel, the technical or political ability to cope with such regulations."

Suggestions that were put forth as to how a city can assist small businesses in meeting the requirements of the Clean Air Act include having the city:

- become a party to new source reviews or permit applications
- apply some of its own pollution credit to small businesses
- become a broker and library for pollution tradeoffs to help small polluters
- set up its own air pollution control authority and allocate pollution quotas within the city
- establish a non-profit corporation with responsibility to buy, sell and bank pollution rights
- use their municipal bonding authority to finance environmental pollution equipment for industry
- assist small businesses in seeking pollution control financing guarantees available through the Small Business Administration

In addition to these measures, EPA is currently assessing the specific problems that small businesses are experiencing as well as the best means to relieve this adverse impact. They are looking at regulatory exclusions, variances, and economic considerations. In the end, to ensure the economic viability of small businesses, federal, state and local governments will have to make their regulations more sensitive and responsive to their special needs.

B. Community Development

Community development and air quality are strongly tied together. How a community attempts to achieve its community development goals will have a direct impact on air quality. Some of the measures used by cities in meeting both community development and air quality goals are urban planning and design techniques.

1. Land Use

The relationship between air quality and community development is strong. Housing patterns have long been influenced by air pollution. Historically, in the United States, upper income residential areas in industrial cities have been in the northwest quadrants of the cities. A major reason is that prevailing wind patterns prevent polluted air from flowing in their direction from the center of the city.

Air quality is still a factor in present day community development even though air pollution may now be caused more by auto emissions than by industries. Recent research has shown that

housing and land values are lower in sections of metropolitan areas that suffer from more severe pollution. These neighborhoods are likely to be less attractive investment targets and in most circumstances are homes for lower income families.

Although the Department of Housing and Urban Development (HUD) has no formal policy on the matter, all HUD field offices consider air quality factors in reviewing applications from developers for federally-subsidized housing projects. The depth of current review is, however, uneven. An analysis is made of the severity of air pollution around proposed housing sites. This information is then used to suggest changes that can be made in the location of buildings, playgrounds, general building designs and construction, including selection of appliances, window types, ventilation systems and landscaping, in order to mitigate the impact of poor air quality on the resident's indoor and outdoor activity areas. In some cases, sites have been judged unacceptable because of the severity of the problem.

In determining locations for residential and other facilities, it is important also to judge how a location might contribute to metropolitan air quality problems. Among the many factors to consider are how winds disperse pollutants and what travel patterns might be created by the development. Such siting and land use considerations can have large ramifications on overall planning and community development.

Land use control is a controversial subject. While federal policy requires transportation controls and emission standards for vehicles, federal intervention in land use issues, as was demonstrated by proposed indirect source regulations, has met with a hostile reception. The indirect source regulations required a preconstruction review of shopping centers, arenas, and other indirect sources to assure health related standards would not be violated because of increased vehicular traffic. The regulations were attacked as being a federal intervention in local land use affairs. Air quality alone is not usually a sufficiently strong incentive for local governments to undertake growth management programs.

Land use plans will become increasingly important for fast growing cities where there is low density development. Rapid low density growth, as in the southwest, raises two issues related to air quality. On one hand, local government officials are concerned that clean air regulations and program requirements will limit growth options and inhibit the role of local choice in determining lifestyle preferences. On the other hand, there is concern that low density growth will cause an increase in automobile use that will exacerbate already severe pollution problems.

Suggestions that have been put forth to control this problem include:

- o encouraging local governments to promote land use patterns designed to reduce trip length, number of trips and associated costs;

- promote a pattern of employment which is balanced with respect to population distribution.

Low density development does not have to mean greater distances between home and work, shopping services, or recreation. In fact, while the growth of suburbia is accelerating, communicating distances are decreasing. This is because employment and commercial facilities are dispersing along with the population.

The City of Phoenix has prepared a plan which encourages the use of urban villages for advancing orderly development. It is called the village concept. The villages include mixed housing types, employment opportunities, recreation facilities, shopping centers, etc. The villages, while having their own individual development concepts, will follow the general plan of a high density center with decreasing densities toward the perpheries of the villages. The villages will be to some extent self-sufficient, while relying on the Phoenix area for certain major functions and services. The village concept, while closely matching residential, employment, shopping, and recreational opportunities, would also serve the secondary objective of improving air quality.

Urban revitilization also has related goals of energy conservation and air quality improvement. Studies have been undertaken which have estimated the additional gasoline that would be consumed by travel to proposed shopping centers located outside central cities as compared to gasoline use where the proposed savings were tremendous which means a reduction in vehicle miles traveled and thus a decrease in automobile related pollutants.

Strategies aimed at tilting the trend back in favor of the core city can be developed. One very important ingredient of orderly growth is to avoid premature growth - inducing public capital investments in undeveloped areas, especially roads and water and sewer lines.

Local governments can use their eminent domain and their taxation and spending powers to promote orderly growth. Local government capital investment decisions are primary determinants of where growth will take place. Thus, the construction of public facilities, such as water and sewage plants, can lead to more concentrated land use patterns. Because of the high cost in building these types of facilities, planners will have to be more conscious in developing such plans.

Although limited by fiscal constraints, local governments can purchase land for development purposes. Local governments could purchase a large number of land tracts and then assemble them into a single ownership parcel that could then be master planned for efficient mixed use development.

While zoning is a potentially useful tool for implementation of land use strategies, in reality it can be one of the least effective means of managing growth. This is due to the political factors that tend to dominate zoning and rezoning decisions. Rezoning decisions are typically ad hoc, parochial, and based on narrow considerations.

As our energy supplies become scarcer and more expensive, people will increasingly want to live, shop, and work in a limited setting. Local growth management policy must recognize this fact. Large planned urban centers or urban villages are steps in the right direction - that of meeting the challenge of making the preferred low density style of living both environmentally sound and energy efficient. Planners and policymakers should begin to look forward to the day when people will be able to work and play within a limited urban environment and setting.

2. Urban Design

Specific urban design concepts can play a role in affecting air quality. Structures and land can be arranged to facilitate air flow and thus reduce concentrations of air pollution. Steps that can be taken include:

- o localize buildings to facilitate the movement of air between bodies of water and hills and along valleys
- o avoid the creation of street canyons which trap pollutants
- o avoid the creation of enclosed courts
- o locate recreational activities away from roadways
- o divide parking areas into small segments

In addition to these measures, HUD has developed some rapid evaluation procedures for estimating pollution concentrations, procedures which can easily be used in planning housing projects.* Thus better attention to urban design could be one means of reducing a city's air pollution.

One example of using urban design is the Dayton Climate Project. The City of Dayton is presently exploring an innovative land use strategy for improving air quality. The strategy centers on the environment itself, and how to employ its natural pollution filtering and dispersion characteristics to reduce urban air pollution. This strategy is based on a similar approach tried in Stuttgart, Germany.

The basis of the concept is to use the natural actions of the environment to cool, cleanse, and flush the atmosphere. Proper ventilation and natural cooling are often interrupted in urban areas where there are large proportions of land or rough surfaces such as paved streets, reduce vegetation cover, and tall buildings. The proper orientation of buildings, the use of open space and woodland, and the use of better construction materials can allow the

*Department of Housing and Urban Development Format AP#1, Second Source Manual "Air Quality Considerations in Residential Planning," HUD SIA 1980, Vol. 1-2-3.

environment to better perform its natural cleansing functions. Some of the mechanisms used include: lawned parking lots; shaded sidewalks with awnings and trees; increased vegetation; and removal of obstacles from major air corridors including restricting building heights. Not only do these measures improve air quality, they also serve to conserve energy, reduce noise levels, increase groundwater supplies and generally improve the aesthetic qualities of cities.

3. Urban Management and Planning

Four federal agencies - EPA, HUD, EDA, DOT - are sponsoring demonstration grant programs in eight cities to see if local procedures for reconciling air quality and economic development goals can be developed. The workplans of three cities - Boston, Philadelphia and Waterbury - are examined below.

The Boston program has two parts: 1) to establish and operate an emissions clearing house, and 2) to create and convey offsets to businesses in a manner which was consistent with the city's overall economic development strategy. Boston is now inventorying emissions which are under its control. Once the inventory is completed, a cost-benefit analysis will be applied to choose emissions reduction strategies.

A system will be devised for allocating the offsets created by these municipal actions. The city will then attempt to attract industries which reinforce its economic development strategy. In addition, Boston plans to combine the offsets allocation process

with the city's regular review process for industrial expansion. In the future, Boston hopes to be able to supply technical assistance to industries in the review process and also to use zoning to further air quality goals.

Philadelphia is establishing an offsets clearing house to facilitate private sector brokerage arrangements. The city is considering setting up a system of emissions fees which would be based on the quantity of pollutants emitted. The funds collected by the city would be used to help offset the city's pollution. In addition, the city is identifying industries, specifically clean industries, to which it should target its marketing strategies.

Philadelphia is also involved in the financing of pollution abatement equipment and financed support for innovative control technologies. The pollution control agency is looking at the potential tradeoffs between transportation control measures and economic development to determine whether more stringent transportation controls and/or a greater investment in public transit can leave room for greater industrial growth.

The City of Waterbury will compile an inventory of where the potential for air quality improvements exists. Information on the current air quality situation and or potential offsets will be organized into a grid system composed of 5000' by 5000' parcels of land. The information collected will be published in a planning reference document that will be available to local officials.

This information will be used to forecast emission levels and also to develop the most cost-effective offset strategy to meet a particular air pollution problem. In addition, research will be conducted that will enable the region to slant the marketing strategies toward industries with favorable ratios of emissions to employment.

All three of these projects, Boston, Philadelphia, and Waterbury's, are aimed at developing air quality control strategies and meeting each city's economic development objectives and goals.

C. Transportation

The difficulties in implementing a successful transportation related air quality program are almost as great as the promise such efforts offer. Most cities have emphasized one or more type of transportation control in their air quality programs. Because of the inherent relationship between air pollution and automobiles, these controls are generally aimed at controlling vehicular emissions by reducing the dependency on the automobile. Carbon monoxide and ozone, as evidenced by the extension of attainment of standards to 1987 if necessary, are the toughest pollutants to control. In virtually every metropolitan area, the bulk of the problem for these two pollutants stems from automobile exhausts.

Generally, two approaches are available for controlling auto related pollutants. These are transportation control measures which are designed to limit vehicle miles traveled (VMT) and congestion to reduce emissions, and inspection and maintenance (I&M) programs

which require owners to maintain the efficiency of the vehicle emission control system. The Clean Air Act requires a state to adopt an I&M program when an extension for attaining the ozone or carbon monoxide standard past 1982 is necessary. I&M programs augment federal vehicle emission standards which limit the amounts of allowable pollutants from automobiles. A third approach to controlling auto related pollutants is mobile source banking. This is a new idea that has not yet been fully developed, however, it holds promise for reducing vehicle emissions and exchanging them for stationary source emissions. This section of the Guide will examine these three programs - transportation control measures, inspection and maintenance (I&M) and mobile source banking and describe how each can achieve an improvement in urban air quality.

1. Transportation Control Measures

Transportation Control Measures are strategies that can be implemented in the short term to improve the efficiency of existing roadways. Some of these measures are proscriptive in that they restrict or attach high costs to activities such as parking downtown, driving alone to work, etc. Other measures elicit voluntary participation by businesses and commuters such as staggering work hours, using public transportation, or joining carpools. Other measures, such as traffic flow improvements or better transit service, require capital investments.

Most transportation control measures concentrate on work trips, which nationally account for about 37 percent of VMT.

Officials with the responsibility to implement these strategies are realizing that employers can be partners in the efforts to reduce VMT from work trips. Programs are designed to elicit the voluntary participation of employees by offering incentives. The role of the employer in a program is to ensure that employees will come to work by means other than single occupancy vehicles. Employers in the program encourage carpools, support vanpools, provide transit tickets or passes, modify parking facilities, or even operate voluntary I&M programs for company and possibly employee vehicles.

The employers are attracted by incenti es that allow them to reduce costs of providing parking facilities for employees. Zoning ordinances can be modified to reduce parking requirements for offices and plants of the participating businesses. The employer saves in both land and development costs. Also, private employee participation offers new resources for use in air quality improvement strategies.

One example of a proposed transportation control program is the Los Angeles Parking Management Plan which should accomplish some transportation control objectives voluntarily. The city's Parking Management Plan is designed to reduce automobile traffic and parking demands and thus air pollution within the city while simultaneously encouraging development and rehabilitation efforts by the private sector. The thrust of the program is to link reductions in parking supply with an obligation to commensurately reduce parking demand. The program concentrates on the commuter

work trip. The city will allow a developer/employer to provide fewer parking spaces in return for an obligation to reduce parking demand by employees. With parking spaces ranging in cost up to $20,000 in high rise buildings, employers can avoid these costs by supporting such efforts as charter buses, car and van pools, transit subsidies, park and ride programs, and information and assistance for ridesharing, etc. Under the proposal, it is the employer's responsibility to achieve the reduction in employee parking demand to meet supply. The legal arrangements and potential sanctions for enforcing the program are presently in the formulative stages.

The strength of the program is its ability to encourage economic development while reducing VMT. Office building developers can expect to reduce construction costs. Industrial firms could institute parking management programs and expand operations on to property now used for parking. Of long range significance is the fact that the program brings private funds into a program where public funds are presently strained to the limit.

In Phoenix, businesses and the city supported various programs to reduce the number of cars on the street. They established a carpooling and vanpooling system and together they subsidize bus tickets for employees. The bus system has been very successful in recent years, showing a steady increase in ridership. Avoiding the cost and availability problems of gasoline and by-

passing congestion, rather than improving air quality, are cited as the objectives of the new transit riders.

In Houston, the Metropolitan Transit Authority is attempting to make more efficient use of existing transportation systems. The city has initiated an area-wide carpool matching program and in addition private employers are being encouraged to establish vanpool programs. As other cities have found the use of employee vanpools is appealing because implementation utilizes private resources rather than public funds.

Transportation control measures have great potential for reducing some pollutant levels but because they focus on changing the travel habits and lifestyles of residents they can meet citizen resistance. There is also resentment over what many perceive to be a federally imposed set of rules without sufficient local input.

There is general agreement that neither local officials, nor citizens nor businessmen will pay for transportation controls as a means for improving air quality. To gain public support planners and policymakers will have to convince the public that the changes are worth it and that they have a multiplicity of benefits. The control measures must be linked to mobility, fuel savings and time savings.

2. Inspection and Maintenance Programs

As adopted by Congress the vehicle Inspection and Maintenance program is intended as a means of reducing vehicle pollutant emis-

sions. The Clean Air Act requires a state to adopt an I&M program when an extension for attaining the ozone or carbon monoxide standards past 1982 is necessary.

Until 1982, most states are attempting to come into compliance using a combination of stationary source controls, the federal motor vehicle control program (which includes standards for new cars), and transportation control measures. Only five states, Arizona, New Jersey, Rhode Island, Nevada and Oregon, had adopted the I&M strategy before the 1979 SIP revisions. According to EPA, urban areas in 29 states will be required to operate I&M programs by 1982. These states are Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Pennsylvania, Delaware, Maryland, District of Columbia, Virginia, North Carolina, Georgia, Tennessee, Kentucky, Ohio, Michigan, Indiana, Illinois, Wisconsin, Missouri, Texas, New Mexico, Colorado, Vermont, Arizona, Nevada, California, Oregon and Washington.

Although a common perception of I&M is that it is simply a mechanism to get carburators adjusted and sparkplugs changed, it actually is an interrelated system of incentives, disincentives and feedback regarding vehicle emissions. It provides an inducement to car owners to take care of their cars and penalities if they do not. It also sends a message to mechanics that emissions must be looked at as a part of proper vehicle maintenance and to the manufacturer that the emissions performance of in-use vehicles will be more extensively monitored.

An I&M program consists of two procedures. The first requires vehicles to be inspected for emissions of hydrocarbons and carbon monoxide in excess of standards. The second procedure requires that vehicles which have failed to meet the established criteria be repaired in order to pass the emissions test.

It is best to "phase in" an I&M program rather than institute" one. A phase in might consist of a three step progression beginning with voluntary inspection and voluntary maintenance, followed by a program of mandatory inspection and voluntary maintenance, and finally mandatory inspection and mandatory maintenance. Other phase-in approaches are also possible.

Each of these programs should be associated with a public education effort. It should not be assumed that the public understands the benefits or even the reasons for I&M. Foremost in the public mind may well be the feeling that the government is dictating to them that their car must be inspected. This is precisely why no transportation control strategy has generated more controversy than I&M. The automobile is perceived as the cornerstone of the American way of life. Any legislation or even suggestion that would upset the balance between freedom and the car, whether it be carpooling or inspection, must be preceded and accompanied by a vigorous public information campaign.

Such a campaign should focus on two merits of I&M. The first is that I&M is a very effective air pollution strategy and it also is extremely cost effective. It can achieve hydrocarbon

reductions for about $1000 a ton which is quite a bit lower than many control strategies for hydrocarbon emissions. Typically I&M programs cost about $5-7 a vehicle. I/M also significantly reduces ambient carbon monoxide. Studies show that carbon monoxide levels in New Jersey, which has had a mandatory program in effect for four years, have decreased at a faster rate than elsewhere in the country.

The second merit of I&M, which is often overlooked, is the economic value it can convey to a city. An I&M program can serve as a tool for economic growth. By reducing hydrocarbon and carbon monoxide emissions from mobile sources, the credits from these pollutants can be applied to stationary sources. An area could then accomodate additional stationary sources. A plan for urban economic development could integrate an I&M program to reduce vehicular emissions with a program to expand and construct facilities.

Despite obvious benefits, I&M programs raise as many questions as they answer. What should be the geographic boundaries of an I&M program? Drawing a line around the areas from which the pollution originates is both difficult and a politically thorny issue. The optimum solution in most cases is to incorporate an entire metropolitan area even if parts of it do not show a need for I&M from an air quality standpoint. In Tucson, for example, a political decision was made to include even some rural areas in the program. Conversely, the New Jersey I/M program was adopted statewide because the issue of excluding some areas was not thought to be equitable.

A second question that is often raised is whether state enabling legislation is necessary for local I&M programs. Albuquerque, Salt Lake City, Memphis, Nashville and Cincinnati are examples of cities that have gone ahead without state approvals. In Cincinnati, however, the efforts of local officials to implement a program are impeded both by the lack of regional implementation and by the lack of enforcement which stems partially from the lack of state legislation. Because there has been a local auto safety inspection program since the 1940's there is some likelihood of public acceptance. Nevertheless, the city is contemplating both an extensive enforcement and public education program.

Another question to contend with is how does fuel switching affect inspection and maintenance? Fuel switching has the effect of immobilizing the vehicle's catalytic converter and negating at least some of the air quality benefits the catalyst is expected to convey. Spot shortages of unleaded fuel in the region may have increased the incidence of fuel switching.

In addition there is the question as to what the frequency of required inspections should be. Most programs call for an annual inspection. There is greater public opposition to an increased number of mandatory inspections.

Arizona adopted I&M in part to avoid conflicts with its auto-oriented lifestyle. The I&M program in Arizona has been

credited with making progress in reducing emissions, especially in 1977 when maintenance was first required and in 1979 when the stringency of the carbon monoxide emission standard was increased. The carbon monoxide situation until just recently had shown consistent improvement despite a period of rising travel and increasing congestion.

Despite its apparent effectiveness, the inspection and maintenance program continues to generate much controversy around the nation and in Arizona. Various groups critize the program as too costly, unnecessary given recent improvements in auto technology, and lacking effectiveness in reducing ozone levels. Three large states, California, Ohio and Michigan have refused to adopt I&M programs in defiance of the 1982 deadline. Administrator Douglas Costle has been quite adamant in stating that EPA intends to remain firm in requiring I&M programs in the states where they are necessary according to the law. Other states, including Arizona, are keeping a watchful eye on EPA's insistence on I&M programs.

Within Arizona, the I&M program which withstood the test of a statewide referendum, now faces another challenge. While state legislation authorizes the program to continue, the self-funding mechanism of inspection fees expires at the end of 1980. In anticipation of this upcoming legislative issue, the legislature formed a committee to study the legislation. The committee report will be an important step in the consideration of whether and how to continue the program.

The City of New Orleans is in the process of planning an I&M program and it hopes to embark unilaterally on it with EPA support. With the program, the city hopes to fulfill its two objectives of improving air quality and banking the mobile source emissions under the offsets banking program being developed by the Louisiana Air Control Commission (LACC). Both the LACC and the Department of Natural Resources have expressed support for the city's efforts.

New Orleans currently operates its own vehicle safety inspection program. The city anticipates including emissions inspections in its annual safety inspections now being conducted at the city-operated centralized inspection points. While city officials feel that state law allows emissions inspections, changes in city ordinances would be necessary to include exhaust systems in the inspection procedure. Many operational decisions will have to be made in devising the program. Among them are the kind of testing equipment used and how it will be calibrated; the emissions standards expected of different aged cars; and the kind of maintenance repairs required and their costs.

Program officials in the Mayor's Office realize the importance of gaining public support, especially considering the voluntary adoption of I&M by the city. The city has applied for EPA funding to support a public information program.

Inspection/Maintenance Programs do offer one of the most efficient and cost effective means of reducing mobile source pollution as well as allowing a way for additional economic growth. Whether or not successful programs can be instituted depends in large part on local government's belief that they are worthwhile and on their initiative and ability to convince the public that a program is in their best interest.

3. Mobile Source Banking

The concept of mobile source banking may provide a link between mobile source emissions and the control of stationary sources. While mobile source banking remains in the conceptual stage without any working system to emulate, the idea could bring mobile and stationary sources together by creating a system for exchanging mobile source emissions for stationary source emissions. Such an arrangement could provide an avenue for industries to expand by acquiring mobile source offsets rather than other stationary source offsets. Although mobile source and industrial emissions do differ to an extent, valuable offsets could be generated for hydrocarbons, nitrogen oxides and particulates.

Mobile source banking proposals concentrate on work-related trips, including business-related trips during the day, and commuter trips. Statistics on a national basis show that 7.9% of VMT are devoted to business-related travel and 33.7% of VMT are for commuter trips. Firms that reduce the VMTs of their employees could use or bank the emission reductions for offsets. Companies

could also embark on additional emission reduction projects to create bankable offsets. These measures could include company and employee vehicle inspection and maintenance programs, alternative fuels programs, etc.

The mobile source banking concept is appealing because it offers an incentive for business firms and individuals to reduce emissions. Changes in lifestyles or business practices could carry some reward under this system. Of course, enforcement procedures over the long run would be necessary to ensure extended compliance.

The proposed Los Angeles Parking Management Program is an example where incentives are used to induce mobile source emission reductions. By providing commuting alternatives for its employees, a firm may be granted a reduction of on-site parking requirements. This is a powerful economic incentive in that escalating construction costs, land prices and financing charges make provision of parking spaces a sizable capital expenditure. Mobile source banking could be structured with the same type of incentives, thus gaining public support and viability.

Mobile source banking is acknowledged by Los Angeles as a potentially useful tool. It offers the area the ability to gain offsets and accomodate growth while helping to reduce dependency on the automoible. Though still in the conceptual stages, mobile

source banking may provide a politically and economically palatable incentive for the lifestyle changes that will be necessary to reduce mobile source emissions.

D. Air Quality

How a city reconciles its development and environmental objectives depends as much on growth and economic trends as on the requirements of the laws themselves.

Compliance with the Clean Air Act and its Amendments can follow two courses. Taking one course, carefully developed plans and well managed emission reduction programs can not only achieve clean air and the attributes associated with it, but can also offer industry - exisiting and new alike - reliable and practical growth opportunities. On the other hand, lack of local initiative and commitment in complying with the CAA will most likely result in tight restrictions on new emissions leading to a slowing or cessation of industrial growth, as firms seek out other areas more knowledgeable and understanding of their needs. Therefore, it is important for local officials to be aware of emission management options and to be well prepared to aid industrial firms with their development needs.

In this part of the Guide several aspects of the clean air and growth issue are discussed. The first section discusses the various options available to cities in integrating environmental and economic development goals. In the second section the relationship between air quality and energy is described.

1. Options for Managing Emissions Growth

In nonattainment areas, the concern is growing that economic growth and clean air may be inconsistent goals. While the Clean Air Act does provide local officials with opportunities to develop programs for fostering economic growth and simultaneously meeting requirements of the law, only a few local governments have been actively involved in developing air quality plans.

The banking and offset policies offered by EPA as the fundamental means to achieving these goals have been described in detail earlier in the Guide and will not be repeated here. The strategies that will be mentioned include:

- o Emission fees
- o Transferrable emission reduction assessments
- o Bubble concept
- o Emission density zoning

a. Emission Fees

Emission fees would supplement regulations and serve as an economic incentive to attain air quality standards. A charge would be attributed to a certain amount of pollution which the polluter would be obligated to pay. The aim would be to set the fee at a level which would make it more profitable for the polluter to reduce emissions than pay the fee.

An advantage of the emission fee system is that within the context of having to pay for pollution, it is likely that polluters will be stimulated to find economical ways to control emissions.

However, serious disadvantages include the difficulties of determining the emission charges and the fact that this system would in effect, grant a facility the right to pollute rather than control the pollution if it chose to do so.

b. Transferable Emission Reduction Assessments

Transferable emission reduction assessments (TERA) is an air quality control concept designed to integrate the compliance of CAA regulations with economic efficiency. It is, in a sense, an enhanced offset mechanism. Through the TERA system, air quality objectives are furthered by taking advantage of industry's specialized expertise in pollution control technology, so emission reductions can be obtained at the lowest overall cost. TERA could be employed to bring an area into attainment or to provide a margin of growth. In situations where Reasonably Available Control Technology (RACT) is not able to bring an area into attainment, or where reasonable further progress is not being achieved, additional emissions reductions can be provided through TERA.

The first step under a TERA system is to determine the emission reductions needed to meet air quality standards or provide for a growth margin, after RACT requirements are met. The responsibility for achieving these needed extra reductions is then allocated among all stationary sources in the region in proportion to individual post-RACT emissions. For example, if it is determined that the air quality control region needs an additional twenty-five percent reduction in emissions, each source within the

region would be required to provide additional reductions equivalent to twenty-five percent of its own post-RACT emission inventory. The reductions could be obtained in a number of ways:

1. By adding on more stringent hardware controls, changing products or processes, or altering operating hours, the source could internally achieve the necessary reductions.

2. Directly purchasing offsetting reductions from another source.

3. Purchasing offsets indirectly through payment of an emission fee to an authorized agency, which could purchase offsets from other sources.

4. Indirect purchase of offsets through a private or public broker who negotiates reduction trades.

In this way it is possible for a firm to meet its reduction obligations by financing reductions for other sources. This flexibility provides an incentive to sources to make full use of specialized or site specific control measures and permits firms to trade reduction requirements to obtain a combination of controls at a minimum cost. Emission reductions beyond those required by law could be credited or sold as offsets. All reductions and offsets would be certified by an appropriate authority.

Although this concept has not yet been employed, its application offers several potential rewards. It provides a mechanism for achieving attainment through an equitable division of responsibility, and it provides industry with the flexibility and incentives to use its specific technological knowledge to achieve required reductions.

c. Bubble Concept

Another form of emission reduction management is the bubble concept, so called because it would treat each plant complex as if it were encased in a bubble with attention focused on the total pollution, instead of on each pollution source. A refinery, for example, might be allowed to emit more hydrocarbons than originally allowed from processing leaks which are expensive to control, if it offset the increase with a decrease in hydrocarbon emissions from storage tanks, which are less costly to control. The end result would be a cost savings for the refinery, without any increase in total hydrocarbon emission from the refinery.

The advantage of this strategy is that it enables industry to determine the best way to clean up air pollution at individual plants. It is a flexible approach to regulation and should both stimulate the discovery of new control techniques and substantially reduce the cost of implementing them.

d. Emission Density Zoning

As noted previously, emission density zoning (EDZ) is an air quality regulation which establishes legal limits on the amount of pollutant emissions within defined spatial areas. The intent of EDZ is to maintain present air quality standards and to avoid places where there are high concentrations of pollutants. The conceptual framework of emission density zoning is similar to that of land-use zoning.

Just as permitted uses and densities are established for particular zones of land based on planning objectives, emission density limits (EDLs) are established for various land areas on the basis of air quality objectives. EDZ is related to land use planning because the amount and character of pollutant originating from a piece of property is largely determined by the use of the land and density of development. The regional land use plan serves as the foundation for determining emission limits. A regional agency determines the total amount of emissions that would maintain air quality at acceptable levels. Local jurisdictions then allocate their share of permitted pollutants to property in accordance with future land use objectives.

Although it would be possible to specify limits for every land use category, EDZ emphasizes industrial uses, the major contributors of stationary source emissions. FDZ is not readily applicable to mobile source emissions, as emission density limits are established by land area, making it difficult to account for temporary or transported pollutants. Sulfur oxides and particulate pollutants are the current prime targets of emission density zoning. Application of this system to mobile sources also seems feasible.

The structure of the EDZ process provides an opportunity to develop a transferable emission rights market. Comparable to transferable development rights in land use planning, transferable emission rights would allow emission rights to be tranferred from

one property to another to accommodate changes in growth patterns or the needs of a particular source. However, to avoid high concentration of pollutants, rights would be transferable only to adjacent properties or properties within a specified zone.

Under EDZ, an industrial firm seeking to locate in an emission density zoned area will have to consider air quality constraints in addition to traditional site selection factors. If location at a particular site would cause a violation of air quality standards, the firm would be required to take one of three actions. First, it could install additional emission control equipment sufficient to reduce emissions to an acceptable level. Another alternative would be to purchase more land than required for the facility thereby decreasing overall emission density. The firm could also choose to purchase the emission limits of adjacent properties which would also serve to decrease emission density. If no solution could be found, the necessary construction permits would be denied by the appropriate local jurisdiction.

Although the Clean Air Act of 1970 and subsequent Amendments do not require land-use controls as a part of a SIP, they do not preclude them. In fact, the Act encourages supplemental actions aimed at attaining air quality standards. It is legally possible for either the state or a local government to administer an EDZ program, providing a particular state statute does not prohibit it. Implementation of an EDZ program requires considerable cooperation between regional authorities and local jurisdictions.

Intergovernmental cooperation is particularly important in reaching an equitable allocation of regional emission rights. Although EDZ is limited in scope, it offers a jurisdiction, a supplemental mechanism for controlling stationary source emissions and maintaining air quality.

2. Air Quality and Energy

The relationship between air quality and energy supply is complex and can be confusing. The goals of air quality and energy conservation in many ways are synonomous. For example, reducing auto travel reduces auto exhaust emissions. Lowering electrical power demands can reduce the need for operating relatively high polluting peak-load generating equipment. Shortages of certain types of energy supplies, however, can exacerbate air pollution problems. Energy shortages, for example, in the short run can lead to fuel switching in automobiles and in the long run can create pressures for additional and modified energy production facilities.

This section views the energy shortage/air pollution situation as two topics: auto-related challenges and national energy concerns.

a. Auto-related Challenges

In general, air quality and gasoline conservation strategies are compatible. Air pollution control technology, in the form of catalytic converters, has complicated the relationship to a large

degree. The catalysts, to retain their effectiveness, require the use of unleaded gasoline. Unleaded fuel, however, has numerous drawbacks:

- o It is more expensive to consumers than leaded fuel.
- o It is less efficient to refine. Producing unleaded fuel is roughly 10% less efficient than producing leaded fuel.
- o Federal and state limits on leaded fuel production reduce the output of unleaded fuel. The use of lead in some fuels releases the high octane hydrocarbons needed for producing unleaded gasoline. Thus, reductions in leaded fuel production make production of unleaded fuel more difficult.
- o Additional or modified refinery capacity will be needed to produce unleaded fuels in necessary quantities.

Producing sufficient unleaded gasoline is important, because without unleaded fuel, motorists with catalysts may substitute leaded fuel which poisons the catalysts and increases emissions. The poisoning of catalysts, if widespread, would also affect the efficiency of an inspection and maintenance program. A very high failure rate might create image and political problems for a program that undoubtedly will be controversial.

Perhaps the most effective action state and local governments can take to reduce energy consumption and improve air quality is to establish a strong inspection and maintenance program (I&M).

Local governments must take an active role in the I&M phase of mobile source control. They, more than any other level of government, can effectively institute control programs to reduce fuel switching and tampering incidences and ensure that pollution control devices on automobiles are in proper working order. As one EPA official admitted, "The Federal government is not well equipped to address the hundreds of thousands of commercial repair facilities and fleet operators and the driving public. To fully address that problem, state and local agencies are going to have to play a prominent role."

b. National Energy Concerns

Southern California is one of the major petroleum industry centers in the United States. In addition to major oil fields, the area contains refineries, pipelines, and shipping facilities for imports and exports of petroleum products all of which contribute to the region's air pollution. The growing energy requirements of the country will likely lead to efforts to increase the diversity as well as the scale of the energy industry. Proposals include pipelines, tanker traffic, refining of heavy crude oils, and modifications/expansions of existing refineries. Until recently, decisions on these matters have been made based largely on consideration of local political, environmental, and economic issues by local or possibly state agencies rather than by federal agencies.

Recent events may move some of these major decisions out of the local arena. With the proposed creation of an Energy Mobilization Board (EMB) which will have the responsibility and authority to cut through redtape and delays in completing key energy projects, fears have been raised concerning the waiving of state and local laws and national environmental laws such as the Clean Air Act. It is expected that the final piece of legislation will allow the EMB to "negotiate" with local governments on the waiver of local laws and ordinances but that it will allow the EMB to relax environmental standards when necessary.

The energy topic is a combination of the economic growth and the transportation issue. The consumption of gasoline and the issues of fuel switching and tampering is a subset of the transportation issue. By encouraging gasoline conservation and enforcing regulations against fuel switching and tampering, both energy and air quality goals are forwarded.

Energy production including the necessary pipelines, refineries and other facilities necessary to produce energy is part of the economic growth issue involving the siting of large stationary sources. These energy suppliers, so essential to the goal of energy independence, must compete with all other large industries for the limited number of available offsets, thus incurring costly delays and further postponing the nation's ability to meet its energy demands. Obviously the goals of air quality and energy production directly conflict in this instance. A delicate balance will need to be established between the two goals to ensure acceptable energy self sufficiency progress.

III. RECOMMENDATIONS FOR CITY ACTION

It is incumbent on local governments and the private sector to identify the constraints and opportunities implicit in the national clean air program. Local governments and the private sector must work together to shoulder the responsibility for reconciling clean air with economic development goals. Recommendations to accomplish this goal include:

- o Assure city residents that firms will be good neighbors. Local governments may have to play an increased role in assuring that new and existing industry will achieve and remain in compliance with clean air laws and regulations.

- o Provide assistance to business and industry. This can take several forms:

    1) technical assistance to help understand and comply with mandated standards as well as to apply for and obtain emission offsets

    2) financial assistance to help them meet control technology requirements. These finances might come from municipal funding sources

    3) the establishment of a one-stop permitting agency to reduce costs and time associated with obtaining permits

    4) obtain waivers from state and federal authorities for hardship cases

    5) seek federal funds to help avoid economic dislocation that may result from stationary source requirements

6) make available existing public authority for tax exempt financing of pollution control equipment or take legal steps to create such authority if none presently exists

7) provide expertise on the range of financing options available under federal or state law to enable industry to meet pollution control requirements.

- o Establish a system for the allocation of offsets. This system could take the form of a clearinghouse. Local governments must get involved in the development and administration of emission offsets.
- o Integrate air quality considerations into local planning and decisions. By developing a master plan, local governments can order their priorities and develop strategies for improving air quality.
- o Identify the role of the mayor in bringing to the fore the public interest of jobs, clean air, and a viable healthful community.

  In many cases involving a dispute between private businesses and a control agency, there tends to be an advesary situation. It should be the mayor's responsibility, as one mayor stated to "bring these parties together, pound the table if necessary for common sense, for a balanced approach."
- o Involve the public in the air quality decision making process. This is the only guarantee that policy decisions will be successfully implemented over any period of time.

It must be recognized that there is a difference between public participation and public relations and that "selling" a program does not constitute public participation. Public participation has the best chance of succeeding if people are met on their own grounds and in terms they understand. Methods to use include meeting with people at their jobs or homes; assisting public interest groups in providing information to their members; and establishing advisory committees composed of representatives of groups with an interest in the issue at hand. Probably the most frequently used public "participation" technique is the public hearing even though this method generally does not work well. Usually hearings are too formal and fail to provide usable information. In addition, they are frequently held on inconvenient occasions at a time in the decisionmaking process when it is too late to get meaningful public input.

- Local officials should involve themselves to a greater extent in air quality issues. It often seems that unless the public comes to the local elected body, raises concerns and demands action, public officials are not likely to engage themselves in the issue. Intensive local involvement will be required if long-term progress is to be realized.

- Increase coordination among city offices that are involved in the air quality planning and management process. This includes local government agencies involved in air pollution control, transportation, community development, and economic development because the work of each of these has an impact on the programs of the others.

  Methods to increase coordination include: the establishment of an Environmental Office such as has been created in New Orleans, to coordinate the city's efforts; use of the A-95 comprehensive planning review process to insure that proposed projects are consistent with good air quality; and the establishment of an Air Quality Committee composed of representatives from the various city agencies to coordinate and establish air quality guidelines.

- Develop a stronger relationship with federal and state agencies. All three levels of government must work together to meet the national clean air standards. Local governments more often than not feel that they are dictated to rather than consulted in the air quality management process. This results partially from the fact that the federal government has the resources to perform the necessary studies, while the local governments do not. Thus, what generally occurs is that rather than ask local governments to come up with original answers, the federal and state governments merely look to the locals for a reaction to alternatives they suggest. Local governments

must insist upon their rights of involvement in the air quality planning process.

- o Increase involvement in transportation related elements of the State Implementation Plan. This includes:
  1) lend public support to transportation control measures;
  2) encourage changes in lifestyle and travel habits and
  3) play an active role in inspection and maintenance phase of mobile source control

IV. CONCLUSION

It is at the local level that resolutions of conflict between the Clean Air Act and economic growth can be achieved. The Clean Air Conferences showed that local government officials, businessmen, and citizens can and are playing a stronger role in the clean air program, although that role is different from what the drafters of the law may have anticipated.

The CAA directed local governments to take responsibility for transportation and mobile source planning. These strategies produce the most public opposition and thus local governments have minimized their involvement. In contrast, stationary source control, which is less controversial, has been the responsibility of state and regional agencies. Local officials realize that growth cushions and offset banking have enormous implications for economic development and thus they have become involved in these strategies as well.

The Clean Air Act is often perceived as a federal or state-imposed program, with little local control. One of the messages of the Clean Air Conferences is that not only must the federal and state governments be involved in the air quality control process but that local governments must also become more involved for air pollution has its greatest impact at the local level. As one conference participant stated, "Nobody lives at the federal level. We all live and work at the local level and it is at this level that we all must work together to resolve our clean air problems."

V. GLOSSARY OF AIR POLLUTION TERMS

air monitoring: sampling for and measuring of pollutants present in the atmosphere.

air pollution control agency: an agency generally on the county, state or regional level responsible for controlling pollutants discharged into the atmosphere.

Air Quality Control Region (AQCR): A geographic region delineated for air quality planning purposes, sometimes referred to as an air quality management district.

Air Quality Maintenance Plan (AQMP): a part of the State Implementation Plan designed to ensure that an area does not develop new pollution problems once it has cleaned up its present problems.

Air Quality Management Plan: a part of the State Implementation Plan that contains the air pollution control measures and implementation strategies that an AQCR will use to attain NAAQS by 1982 and 1987.

air quality standard: maximum allowable level for an air pollutant usually expressed by weight of pollutant per unit volume of air.

ambient air: atmosphere not confined by walls and a roof; outside air.

attainment area: an area that meets the national ambient air quality standards for a given pollutant.

Best Available Control Technology (BACT): air pollution control technology required for new stationary source polluters locating in attainment areas. BACT is less stringent than Lowest Achievable Emission Rate but more stringent than Reasonably Available Control Technology.

carbon monoxide (CO): a colorless, odorless toxic gas produced by the incomplete combustion of carbon-containing substances. The exhausts of gas-powered automobile engines are a major source of CO.

Clean Air Act as Amended in 1977 (CAA): the basic Federal law concerning air pollution.

emissions banking: a system whereby pollution decreases beyond those required by regulations could be reserved as credits over a period of time for future use or sale.

Emission Density Zoning (EDZ): an air quality control mechanism prescribing a maximum legal rate of air pollutant emissions for certain parcels of land.

emission standard: limit established to control the amount of a given pollutant discharged from a particular source.

growth cushion: margin of allowable emissions in a non-attainment area created by applying control measures to existing sources sufficiently stringent to meet 1982 standards and also allow some new emissions.

Inspection and Maintenance Program (I&M): a program required in areas that postpone attainment of carbon monoxide and oxidant standards to 1987. The program calls for the inspection of the emissions control systems of light duty vehicles and the repair and maintenance of those vehicles that fail the inspection.

Lowest Achievable Emission Rate (LAER): the strictest possible emission rate that can presently be met by using the most recent technology. LAER is required of all new stationary source polluters in non-attainment areas.

mobile source: pollution source capable of moving such as automobiles, trucks, and airplanes.

National Ambient Air Quality Standards (NAAQS): Federal standards establishing the maximum allowable level for certain pollutants.

National Emission Standard for Hazardous Air Pollutants (NESHAP): special Federal emission limits for pollutants such as asbestos that are extremely hazardous to human health.

New Source Performance Standards (NSPS): the level of pollution control required for certain major stationary sources as set by EPA. States may be delegated the responsibility of administering NSPS reviews.

New Source Review Process (NSR): the process by which an air pollution control agency reviews a potential stationary source for compliance with control measures, offset requirements, etc. and either denies or issues a permit for the operation of the source.

nitrogen oxides (NOx): gases formed from atmospheric nitrogen and oxygen when combustion takes place under high temperature and high pressure conditions.

non-attainment area: an area that is found to be in violation of national ambient air quality standards for one or more pollutants.

offset: a procedure whereby a proposed polluter arranges for existing polluters to reduce their present pollution levels so that total pollutant levels after the new polluter begins operation will be less than the total level before.

ozone: a pungent, colorless toxic gas; the principal photochemical oxidant.

parts per million (ppm): the number of parts of a given pollutant in a million parts of air; a measure of concentration.

photochemical oxidants: group of compounds produced when hydrocarbons and nitrogen oxides combine in the air in the presence of sunshine.

Prevention of Significant Deterioration (PSD): a provision of the Clean Air Act as Amended in 1977 that protects air quality in attainment or clean air areas by strictly regulating the amount of additional pollution that can be emitted by new sources.

Reasonable Further Progress Reports: required annual reports that will demonstrate how well an air quality control region is moving toward attainment of standards in 1982 and 1987. If the reports show that the region is not making "reasonable further progress," then additional control measures will be required.

Reasonably Available Control Technology (RACT): air pollution control technology required for existing polluters in non-attainment areas. RACT is less strict than either LAER or BACT.

secondary standards: Federally set air pollution levels which go beyond protecting human health to protecting plants, animals, soils, man-made materials, etc.

State Implementation Plan (SIP): a plan prepared by each state for submittal to the Environmental Protection Agency outlining the state's strategy for achieving NAAQS and complying with other requirements of the Clean Air Act. The SIPS include Air Quality Management Plans for the individual air pollution control regions in each state.

stationary sources: non-moving polluters, such as industrial plants, dirt roads, dry cleaners, etc.

sulfur oxides (SOx): pungent, colorless gases resulting from the burning of high sulfur fuels.

suspended particulates (part.): small, solid or liquid suspended matter including soot, dust, aerosols, fumes, and mist.

Transportation Control Plan (TCP): a plan prepared as a part of the State Implementation Plan designed to reduce the reliance on single occupant auto traffic in non-attainment areas and to ensure that necessary traffic emits the least pollution possible.

Transferable Emission Reduction Assessments (TERA): an air pollution control concept whereby post-RACT emission reductions necessary to meet air quality standards are determined and responsibility for obtaining the reductions is assessed equitably among all sources. This additional emission reduction assessment may then be transferred from one source to another, thus permitting achievement of the required reduction at the lowest cost.

variance: permission granted for a limited time, under stated conditions for a person or company to operate outside the limits prescribed in a regulation.

LIST OF NONATTAINMENT CITIES

Urbanized Areas with Population Greater Than 200,000

\- Attainment
X Nonattainment for Primary Standards

URBANIZED AREA	1970 POPULATION	TSP	SO2	OX	CO	NOx
New York, New York Northeastern NJ	16,206,841	-	-	X	X	-
Los Angeles-Long Beach, CA	8,351,266	X	X	X	X	X
Chicago, IL-Northwestern, IN	6,714,578	X	X	X	X	X
Philadelphia, PA-NJ	4,021,066	-	X	X	X	-
Detroit, MI	3,970,584	-	-	X	X	-
San Francisco-Oakland, CA	2,987,850	X	-	X	X	-
Boston, MA	2,652,575	X	-	X	X	-
Washington, DC-MD-VA	2,481,489	X	-	X	X	-
Cleveland, OH	1,959,880	X	X	X	X	-
St. Louis, MO-IL	1,882,944	X	X	X	X	-
Pittsburgh, PA	1,846,042	X	X	X	X	-
Minneapolis-St. Paul,MN	1,704,423	X	X	X	X	-
Houston, TX	1,677,863	X	-	X	-	-
Baltimore, MD	1,579,781	X	-	X	X	-
Dallas, TX	1,338,684	X	-	X	-	-
Milwaukee, WI	1,252,457	X	-	X	X	-
Seattle-Everett, WA	1,238,107	X	-	X	X	-

URBANIZED AREA	1970 POPULATION	TSP	SO2	OX	CO	NOx
Miami, FL	1,219,661	-	-	X	-	-
San Diego, CA	1,198,323	X	-	X	X	X
Atlanta, GA	1,172,778	X	-	X	X	-
Cincinnati, OH-KY	1,110,514	X	X	X	X	-
Kansas City, MO-KS	1,101,787	X	-	X	X	-
Buffalo, NY	1,086,594	X	X	X	X	-
Denver, CO	1,047,311	X	-	X	X	X
San Jose, CA	1,025,273	-	-	X	-	-
New Orleans, LA	961,728	-	-	X	-	-
Phoenix, AZ	863,357	X	-	X	X	-
Portland, OR-WA	824,926	X	-	X	X	-
Indianapolis, IN	820,259	X	X	X	X	-
Providence-Pawtucket-Warwick, RI-MA	795,311	X	-	X	X	-
Columbus, OH	790,019	X	X	X	X	-
San Antonio, TX	772,513	X	-	X	-	-
Louisville, KY-IN	739,396	X	X	X	X	-
Dayton, OH	685,942	X	X	X	X	-
Fort Worth, TX	676,944	X	-	X	-	-
Norfolk-Portsmouth, VA	668,259	-	-	X	-	-
Memphis, TN-MS	663,976	X	-	X	X	-
Sacramento, CA	663,732	-	-	X	X	-
Fort Lauderdale-Hollywood, FL	613,797	-	-	X	X	-
Rochester, NY	601,361	-	-	X	X	-
San Bernardino-Riverside, CA	583,597	X	-	X	-	-

URBANIZED AREA	1970 POPULATION	TSP	SO2	OX	CO	NOx
Oklahoma City, OK	579,788	X	-	X	-	-
Birmingham, AL	558,099	X	-	X	-	-
Akron, OH	542,775	X	X	X	X	-
Jacksonville, FL	529,585	-	-	X	-	-
Springfield-Chicopee-Holyoke, MA-CT	514,308	X	-	X	X	-
St. Petersburg, FL	495,159	-	X	X	-	-
Omaha, NE-IA	491,776	X	-	X	X	-
Toledo, OH-MI	487,789	X	X	X	X	-
Albany-Schenectady-Troy, NY	486,525	-	-	X	X	-
Salt Lake City, UT	479,342	X	X	X	X	-
Hartford, CT	465,001	X	-	X	-	-
Nashville-Davidson, TN	448,444	X	-	X	X	-
Honolulu, HI	442,397	-	-	-	-	-
Richmond, VA	416,563	-	-	X	-	-
Bridgeport, CT	413,366	-	-	X	X	-
Youngstown-Warren, OH	395,540	X	X	X	X	-
Syracuse, NY	376,169	X	-	X	X	-
Tulsa, OK	371,267	X	-	X	X	-
Wilmington, DE-NJ	371,267	-	-	X	-	-
Tampa, FL	368,742	-	-	X	-	-
Allentown-Bethlehem-Easton, PA-NJ	363,517	X	-	X	-	-
Grand Rapids, MI	352,703	-	-	X	-	-
New Haven, CT	348,341	X	-	X	-	-
El Paso, TX	337,471	X	-	X	X	-

URBANIZED AREA	1970 POPULATION	TSP	SO2	OX	CO	NOx
Tacoma, WA	332,521	X	X	X	X	-
Flint, MI	330,128	X	-	X	-	-
Orlando, FL	305,479	-	-	X	-	-
Wichita, KS	302,334	-	-	X	X	-
Albuquerque, NM	297,451	X	-	X	X	-
Tucson, AZ	294,184	X	X	X	X	-
South Bend, IN-MI	288,572	X	X	X	-	-
West Palm Beach, FL	287,561	-	-	X	-	-
Charlotte, NC	279,530	-	-	X	X	-
Trenton, NJ-PA	274,148	-	-	X	X	-
Newport News-Hampton, VA	268,263	-	-	X	-	-
Davenport-Rock Island-Moline, IA-IL	266,119	X	-	X	-	-
Austin, TX	264,499	-	-	X	-	-
Fresno, CA	262,908	X	-	X	X	-
Mobile, Al	257,816	X	-	X	-	-
Des Moines, IA	255,824	X	-	X	X	-
Baton Rouge, LA	249,463	-	-	X	-	-
Worcester, MA	247,416	X	-	X	X	-
Peoria, IL	247,121	X	X	X	X	-
Oxnard-Ventura-Thousand Oaks, CA	244,653	X	-	X	-	-
Canton, OH	244,279	X	X	X	-	-
Columbia, SC	241,781	-	-	X	X	-
Harrisburg, PA	240,751	X	-	X	-	-
Las Vegas, NV	236,681	X	-	X	X	-

URBANIZED AREA	1970 POPULATION	TSP	SO2	OX	CO	NOx
Shreveport, LA	234,564	-	-	X	-	-
Aurora-Elgin, IL	232,917	X	X	X	X	X
Spokane, WA	229,620	X	-	-	X	-
Lansing, MI	229,518	-	X	X	-	-
Charleston, SC	228,399	X	-	X	-	-
Fort Wayne, IN	225,184	-	-	X	-	-
Chattanooga, TN-GA	223,580	X	-	X	-	-
Wilkes-Barre, PA	222,830	X	-	X	-	-
Little Rock-North Little Rock, AR	222,616	-	-	X	-	-
Corpus Christi, TX	208,616	X	-	X	-	-
Columbus, GA-AL	208,616	-	-	X	-	-
Rockford, IL	206,084	-	-	X	-	-
Madison, WI	205,457	-	X	X	-	-
Colorado Springs, CO	204,766	X	-	X	X	X
Scranton, PA	204,205	X	-	X	-	-
Lawrence-Haverhill, MA-NH	200,280	-	-	X	-	-